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PROBLEMS FOR SOLUTION.

ALGEBRA.

215. Proposed by **EDWIN L. RICH**, Lehigh University.

Solve (1)..........$x/a+y/b+c/z=3$,

(2)..........$x/a+b/y+z/c=3$,

(3)..........$a/x+y/b+z/c=3$.

216. Proposed by **L. E. NEWCOMB**, Los Gatos, Cal.

Express by radicals the roots of $x^6+ax^4+bx^3+\frac{1}{4}a^2x^2+\frac{1}{2}abx+c=0$.

217. Proposed by **F. P. MATZ, Sc. D., Ph. D.**, Professor of Mathematics and Astronomy in Defiance College, Defiance, O.

Find the condition that $E\equiv x^5-bx^3+cx^2+dx-e$ shall be the product of a complete square and a complete cube.

218. Proposed by **SAUL EPSTEEN.**

Prove that $\sum\limits_{r=0}^{n}\frac{c_r}{r+1}=\frac{2^{n+1}-1}{n+1}$ where c_r is the coefficient of x^r in the expansion of $(1+x)^n$.

GEOMETRY.

236. *Errata.* This problem should read: If two sides of a triangle pass through fixed points, the third side touches a fixed circle.

248. Proposed by **F. P. MATZ, Sc. D., Ph. D.**, Professor of Mathematics and Astronomy in Defiance College, Defiance, O.

What is the equation to the curve on which lie the centers of the inscribed circles in the right-angled triangles of hypotenuse h?

244. Proposed by **O. W. ANTHONY**, Head of the Mathematical Department, DeWitt Clinton High School, New York.

Upon the sides of a triangle as bases isosceles triangles with base angles of 30° are constructed. Show that the lines joining the vertices of these isosceles triangles form an equilateral triangle.

245. Proposed by **W. J. GREENSTREET, A. M.**, Editor of The Mathematical Gazette, Stroud, England.

PCP', DCD' are conjugate diameters of an ellipse; PN, DM are the ordinates to the major axis at P and D; show $CM/PN=CN/DM=AC/BC$, and that AP and BD' are parallel, and that AP' is parallel to BD.